

Cross Country Ski Ontario Wax Room Safety Guidelines

This document is intended to outline the known occupational health hazards which exist in the wax room Cross Country Ski Ontario. The following guidelines for wax room safety are intended to improve the health and safety in our sport and limit the exposure of wax technicians, support staff, coaches and athletes to the hazards associated with ski preparation.

Wax rooms are considered active work zones whenever irons are in use. Limit exposure to unprotected athletes/support staff by organizing bib pick-up, warm-up and race ski exchanges outside of wax room.

Hazards

Fluoro waxes: The main route of exposure is inhalation when heat is applied with the wax iron heat gun or torch.

Particles in the air: Exposure through applying wax, scraping and brushing. Small particles can penetrate deep into the respiratory system and cause acute inflammation.

Wax removers: Many products contain numerous occupational carcinogens.

Recommended means to control the hazards

Waxroom environment:

- Separate, detached wax room facility with adequate ventilation is required.
- Wax room safety signs/reminders posted
- Be prepared for optional grip wax application outdoors (portable bench, shelter)

Fluoro waxes:

- Use a modern waxing iron with controls for temperature setting. The temperature setting is crucial to the proper melting temperature of the wax.
- Avoid higher temperatures than necessary. A temperature 20°C above the manufacturers recommended melting point will double the amount of inhalable particles
- At temperatures higher than 200°C, fluoro components will start to degrade and form toxic gases

Particles in the air:

- Use mask when applying any fluoro waxes.
- **Always!** Use mask when applying powders. The mask reduces the particle concentration up to 30 times.
- Use safety glasses when brushing, particularly roto brushing.



- Maintain a clean wax area by regularly sweeping wax shavings and disposing of them in garbage bags.

Wax removers:

- Use citrus-based solvents with minor petroleum distillate properties. Not only do they smell better, they are less volatile.

PPE (Personal Protective Equipment) includes a respirator/mask, apron, gloves, eye protection

- Respirator: ensure it fits properly and doesn't leak. Maintain the respirator according to the manufacturer's instructions and adhere to the expiry date of the respirator
- Ensure that every wax technician is outfitted with and wears the appropriate PPE.

Recommended Respirators:

Swix:

Minimum Protection:

3M T4277, Protective Mask \$260.00 \$170.00
(for a limited time)

For the professional waxer: TBA on individual demand

Scott Autoflow: T317590

3M Powerflow Face-Mounted Powered Air Purifying Respirator
http://www.3mcanada.ca/3M/en_CA/company-ca/all-3m-products/~3M-Powerflow-Face-Mounted-Powered-Air-Purifying-Respirator-6800PF-medium?N=5002385+8709324+8710868+8711017+8712275+8720539+8720780+8722037+3293805732&rt=rud

Further reading:

Ski Wax Chemicals Can Build Up in Blood: <http://www.scientificamerican.com/article/ski-wax-chemicals-buildup-blood/>

<http://www.environmentalhealthnews.org/ehs/news/ski-wax-chemicals>

https://en.wikipedia.org/wiki/Perfluorooctanoic_acid

<http://www.ncbi.nlm.nih.gov/pubmed/20831156> numerous articles; search for articles authored by Helena Nilsson, she has done a lot of research

<http://pubs.rsc.org/en/Content/ArticleLanding/2013/EM/c3em30739e#!divAbstract> published 2013

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4305115/> published 2014

<http://pubs.acs.org/doi/abs/10.1021/acs.est.6b01477> published June 15th, 2016

PFC Hits Your Blood Two studies out of Sweden have shown that ski technicians are at risk of highly elevated PFC levels in their blood, and that is cause for concern.

The first study tested perfluorocarboxylate (PFCA) blood levels in eight ski wax technicians before, during, and after the 2007/2008 ski season, and researchers found that the median blood level for PFOA was almost 45 times that of the general population (112 ng/mL compared to 2.5 ng/mL). What's more, it appears that there is a correlation between the levels of perfluorocarboxylates in the blood and the number of years working as a ski wax technician.

A **follow-up study** examining chemicals in the air of the breathing zone of ski wax technicians found that fluorotelomer alcohols (FTOH) - which are a type of PFC that degrade and form PFOA - were 800 times the levels of airborne PFOA. This suggests that biotransformation of FTOH results in internal exposure of PFOA.

References:

Matthew T. Pauli, Team Hardwood Waxing Blog:

<http://teamhardwoodwaxing.blogspot.ca/2015/11/wax-room-saftey.html>

Joel Jaques: Cross Country Canada, 160317 Particles and Peronale Protective Equipment.pptx (contact cd@xco.org for access)

Swix Sport: Ski wax and health. <http://www.swixsport.com/Environment/Ski-wax-and-health>